

## **I. AMENDMENT TO THE CLAIMS**

Please replace claim 1, as shown below. All pending claims are reproduced below, including those that remain unchanged. This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Listing of Claims:**

Claim 1. (Currently Amended): A fixed-frequency beam-steerable leaky-wave microstrip antenna comprising:

a grounded element;

a dielectric coupled to said grounded element; and [[to]]

conducting traces coupled to the dielectric, the conducting traces including:

a pair of non-radiating conductive elements; and

a plurality of radiating strips, each of the radiating strips connected between the pair of non-radiating conductive elements, each of said plurality of radiating strips including a center-loaded varying reactance element.

Claim 2. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 1 wherein each of the varying reactance elements is a variable capacitor.

Claim 3. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 1 wherein each of the varying reactance elements is a varactor diode.

Claim 4. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 1 wherein the pair of non-radiating conductive elements includes:

a driving port having a first and second driving end, the first driving end configured to receive a first driving signal, the second driving end configured to receive a second driving signal, the first signal being 180 degrees-out-of-phase with the second driving signal;

a terminating port having a first terminating end and a second terminating end, the first terminating end connected to a first resistive load, the second terminating end connected to a second terminating load.

Claim 5. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 4 further comprising:

a biasing DC voltage source coupled between the first terminating end and the second terminating end.

Claim 6. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 1 wherein each of the radiating strips has the same width, length and inter-strip spacing.

Claim 7. (Original): A fixed frequency beam steerable leaky wave microstrip antenna comprising:

a grounded element;

a dielectric coupled to said grounded element; and

a pair of radiating strips coupled to said dielectric, the pair of radiating strips separated by a generally uniform gap and including:

variable reactance elements mounted in shunt across the gap.

Claim 8. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 7 wherein the variable reactance elements are about the same.

Claim 9. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 7 wherein each of the varying reactance elements is a variable capacitor.

Claim 10. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 7 wherein each of the varying reactance elements is a varactor diode.

Claim 11. (Original): The fixed frequency beam steerable leaky wave microstrip antenna of claim 7 wherein the pair of radiating strips includes:

a driving port having a first and second driving end, the first driving end configured to receive a first driving signal, the second driving end configured to receive a second driving signal, the first signal being 180 degrees-out-of-phase with the second driving signal;

a terminating port having a first terminating end and a second terminating end, the first terminating end connected to a first resistive load, the second terminating end connected to a second terminating load.

Claim 12. (Original): The fixed-frequency beam-steerable leaky-wave microstrip antenna of claim 11 further comprising:

a biasing DC voltage source coupled between the first terminating end and the second terminating end.

Claim 13. (Original): A method for generating a fixed-frequency beam-steerable leaky wave from a leaky wave microstrip antenna, comprising:

providing conducting traces coupled to a dielectric, the dielectric coupled to a grounded element, the conducting traces including:

a pair of non-radiating conducting strips; and

a plurality of radiating strips, the plurality of radiating strips coupled between the pair of non-radiating conducting strips, each of said plurality of radiating strips including:

a variable reactive-element having a reactance value;  
driving the microstrip with a 180-degree hybrid fixed-frequency signal, the signal configured to excite the microstrip in a first higher order mode and configure the leaky wave antenna to transmit a beam-steerable leaky wave;  
varying the variable reactive-element reactance value to provide continuous fixed frequency main beam steering.

Claim 14. (Original): The method of claim 13 wherein each of the variable reactive-elements is center loaded on each of the plurality of radiating strips.

Claim 15. (Original): The method of claim 13 wherein each of the variable reactance-elements is a varactor diode.

Claim 16. (Original): The method of claim 13 wherein each of the plurality of radiating strips is configured to have a substantially similar length, width and inter-strip spacing.

Claim 17. (Original): A method for generating a fixed-frequency beam-steerable leaky wave from a leaky-wave microstrip antenna, comprising:

providing conducting traces coupled to a dielectric, the dielectric coupled to a grounded element, the conducting traces including:

a pair of radiating strips, the pair of radiating strips separated by a generally uniform gap and including:

variable reactance-elements having a reactance value and mounted in shunt across the gap.

driving the radiating strips with a 180-degree-hybrid fixed-frequency signal, the signal configured to excite the microstrip in a first higher order mode and configure the leaky wave antenna to transmit a beam steerable leaky wave;

varying the variable reactance-element reactance value to provide continuous fixed-frequency main-beam steering.

Claim 18. (Original): The method of claim 17 wherein each of the variable reactance-elements is a varactor diode.